

**Preliminary**

## Harvatek Surface Mount CHIP LEDs Data Sheet B31B3BGR-10C-0005Q4



Official Product	HT Part No. B31B3BGR-20C-0005Q4	Customer Part No.	Data Sheet No.
Tentative Product	*****	*****	
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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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## Product Specifications

Item	Specification	Material	Quantity
Luminous Intensity(Iv)	R : 45-360 mcd G : 71.5-450 mcd B : 18-180 mcd @10mA/ T <sub>S</sub> = 25°C;Tolerance: ± 10%		
Wavelength	R : 615.0-630.0 nm G : 515.0-530.0 nm B : 460.0-472.0 nm @10mA/ T <sub>S</sub> = 25°C;Tolerance: ± 0.5nm		
Vf	R : 1.6-2.4 V G : 2.6-3.4 V B : 2.6-3.4 V @10mA/ T <sub>S</sub> = 25°C ;Tolerance: ± 0.05V		
Ir	< 1 μA @ V <sub>R</sub> = 5V		
Resin	Clear	Epoxy	
Carrier tape	EIA 481-1A specs	Conductive black tape	4000ea/reel
Reel	EIA 481-1A specs	Conductive black	
Label	HT standard	Paper	
Packing bag	220x240mm	Aluminum laminated bag/ no-zipper	One reel per bag
Carton	HT standard	Paper	Non-specified

**Others:**

Each immediate box consists of 5 reels. The 5 reels may not necessarily have the same lot number or the same bin combinations of Iv, λ<sub>D</sub> and Vf. Each reel has a label identifying its specification; the immediate box consists of a product label as well.

Note :This is shipped test conditions

※Remarks: This product should be operated in forward bias. If a reverse voltage is continuously applied to the product, such operation can cause migration resulting in LED damage.

**ATTENTION: Electrostatic Discharge (ESD) protection**

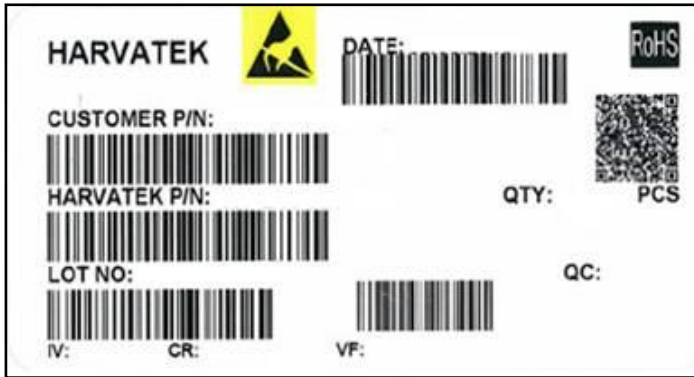


The symbol to the left denotes that ESD precaution is needed. ESD protection for GaP and AlGaAs based chips is necessary even though they are relatively safe in the presence of low static-electric discharge. Parts built with AlInGaP, GaN, or/and InGaN based chips are **STATIC SENSITIVE devices**. ESD precaution must be taken during design and assembly.

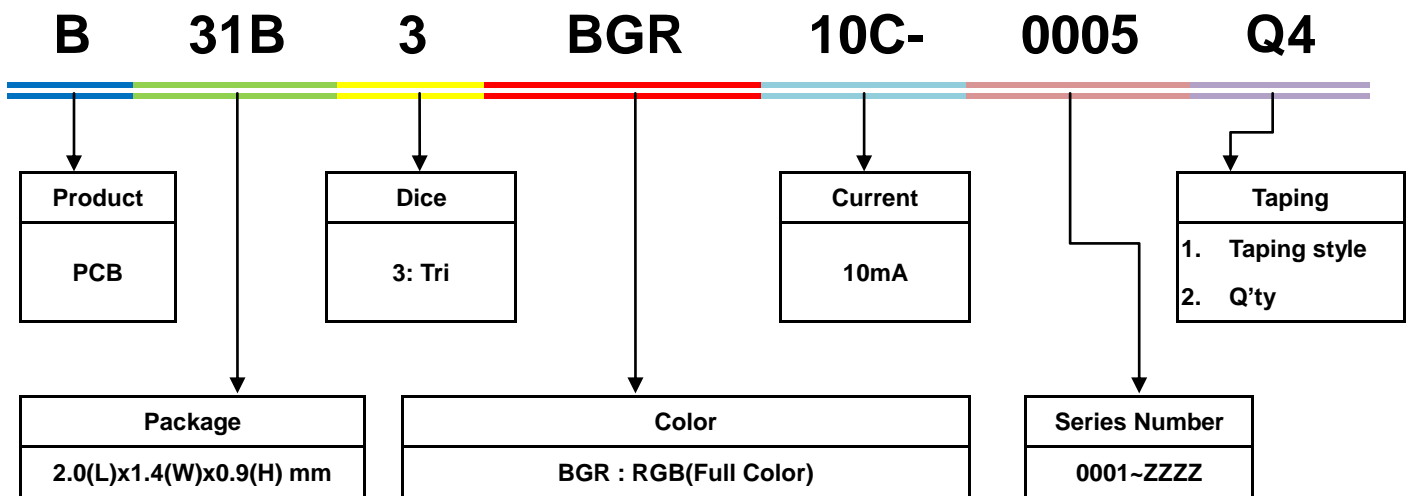
If manual work or processing is needed, please ensure the device is adequately protected from ESD during the process.

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## Label Specifications



### Harvatek P/N:



### Lot No.:

1	2	3	4	5	6	7	8	9	10
<b>E</b>	<b>1</b>	<b>A</b>	<b>1</b>	<b>A</b>	<b>2</b>	<b>2</b>	<b>L</b>	<b>1</b>	<b>2</b>
Code 1 2		Code 3	Code 4	Code 5	Code 6	Code 7	Code 8	Code 9	Code 10
		Mfg. Year	Mfg. Month	Mfg. Date	Consecutive number		Special code		
Internal Tracing Code		2010-A	1:Jan.	1:A	01~ZZ		000~ZZZ		
		2011-B	2:Feb.	2:B					
		2012-C	....	3:C					
		2013-D	A:Oct.	... 26:Z					
		.	B:Nov.	27:7					
.	C:Dec.	28:8							
				29:9					
				30:3					
				31:4					

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## Specifications Range

### ■ Luminous Intensity (Iv) Bin:

Luminous Intensity (Iv) Bin:R/G/B@20mA

HT-B31B3BGR Series								
IV								
Red			Green			Blue		
P	45	71.5	R	112.5	180	M	18	28.5
Q	71.5	112.5	S	180	285	N	28.5	45
R	112.5	180	T	285	360	P	45	71.5
S	180	285	U	360	450	Q	71.5	112.5
T	285	360	V	450	560	R	112.5	180

Note: It maintains a tolerance of  $\pm 10\%$  on luminous intensity

### Dominant Wavelength ( $\lambda D$ ) Bin:

HT-B31B3 BGR Series								
WD								
Red			Green			Blue		
A	615	620	A	515	520	A	460	464
B	620	625	B	520	525	B	464	468
C	625	630	C	525	530	C	468	472

Note: It maintains a tolerance of  $\pm 0.5\text{nm}$  on color

### Forward Voltage (Vf) Bin:

HT-B31B3BGR Series								
VF								
Red			Green			Blue		
E18	1.6	2.4	G38	2.6	3.4	G38	2.6	3.4

Note: It maintains a tolerance of  $\pm 0.05\text{V}$  on forward voltage measurements

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## Product Features

### Electro-Optical Characteristics

(T<sub>Soldering</sub>, 25 °C)

Series	Emitting Color	Material	V <sub>F</sub> (V)		Wavelength λ(nm)			I <sub>v</sub> (mcd)	Viewing Angle 2θ <sub>1/2</sub>
			typ	max	λ <sub>D</sub>	λ <sub>P</sub>	Δ λ	Typical	
B31B3BGR	<span style="color: red;">Red</span>	AllnGaP	2.0	2.4	620	627	16	115	X=120 Y=104
	<span style="color: green;">Green</span>	InGaN	2.9	3.4	523	516	35	290	X=109 Y=111
	<span style="color: blue;">Blue</span>	InGaN	2.9	3.4	467	461	22	55	X=113 Y=113

### Package Outline Dimension and Recommended Soldering Pattern for Reflow Soldering

(Unit:mm Tolerance: +/-0.1)

Outline Dim.	Soldering Pattern
Soldering terminals may shift in the x, y direction.	

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(T<sub>Soldering</sub> 25 °C)

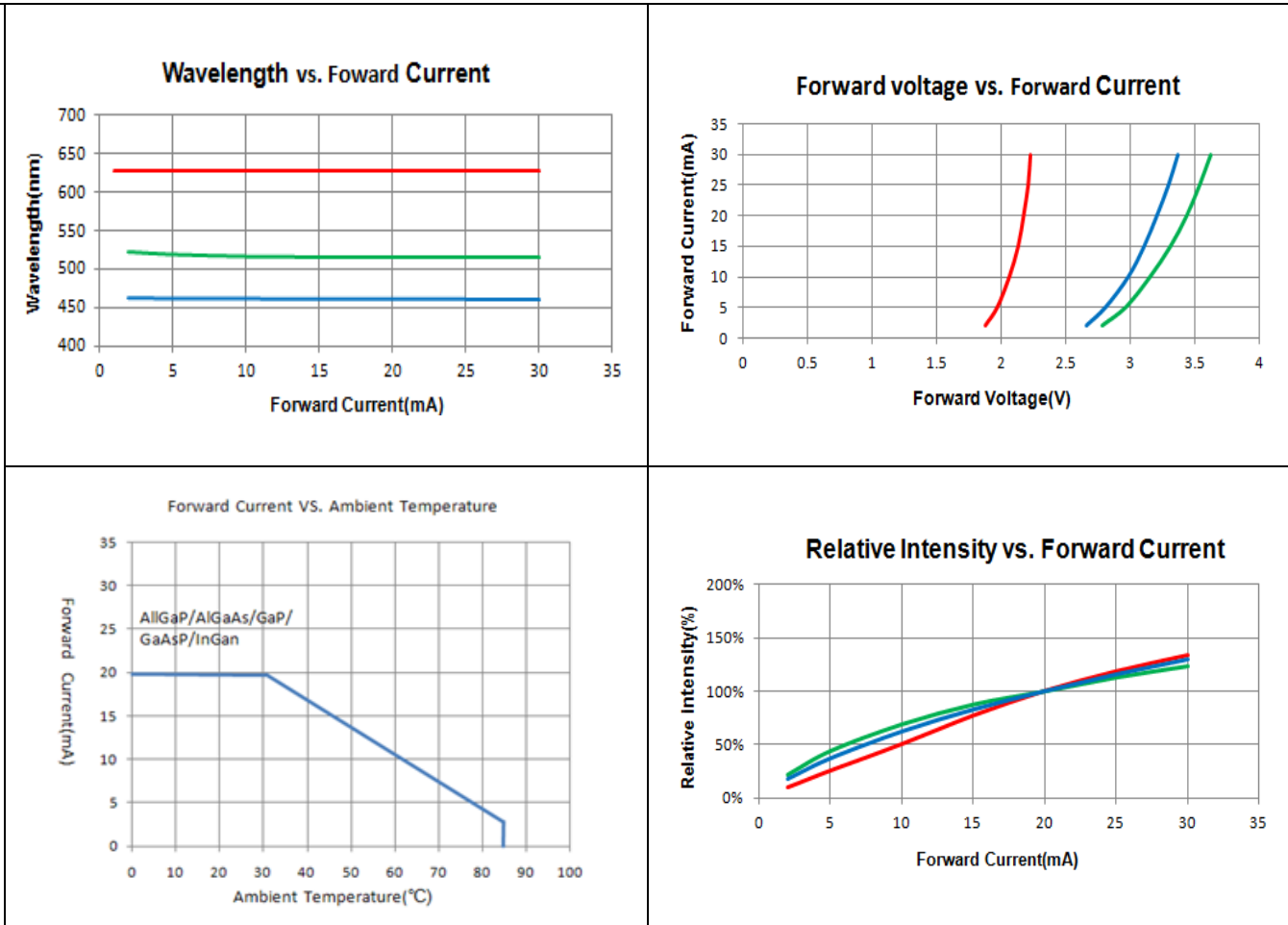
## Absolute Maximum Ratings

Series	P <sub>D</sub> (mW)	V <sub>R</sub> (V)	I <sub>F</sub> (mA)	I <sub>FP</sub> (mA)*	Top(°C)
Color	Power Dissipation	Reverse Voltage	Forward Current	Pulse Forward Current	Operating Temperature
Red	30	5	10	≤ 20	-40~85
Green	40	5	10	≤ 20	
Blue	40	5	10	≤ 20	

\*Condition for I<sub>FP</sub> is pulse of 1/10 duty and 0.1msec width

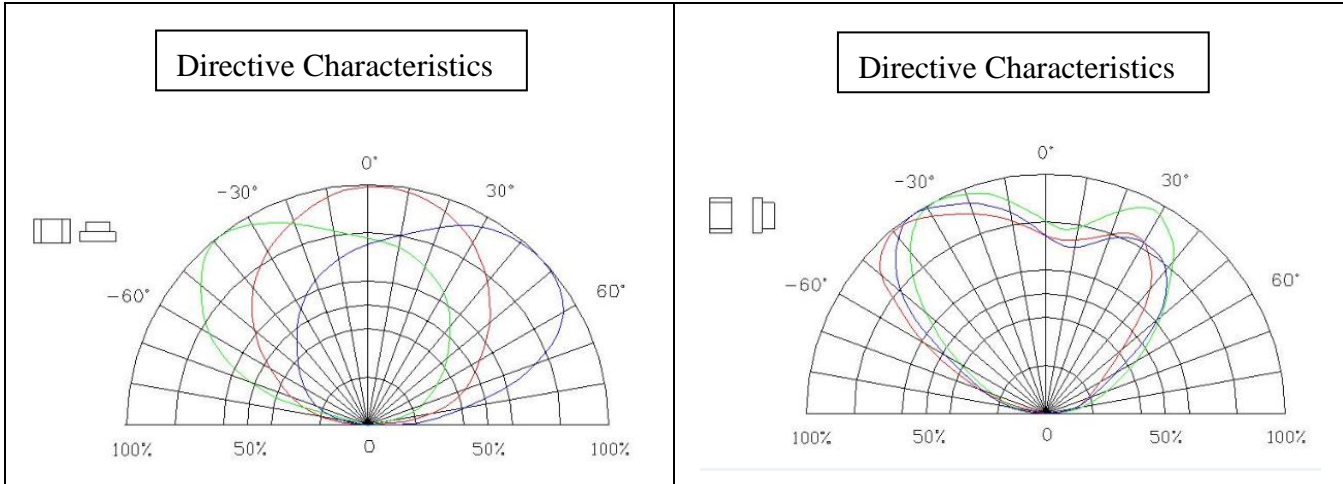
\*Remarks: This product should be operated in forward bias. If a reverse voltage is continuously applied to the product, such operation can cause migration resulting in LED damage.

## Characteristics of B31B3BGR



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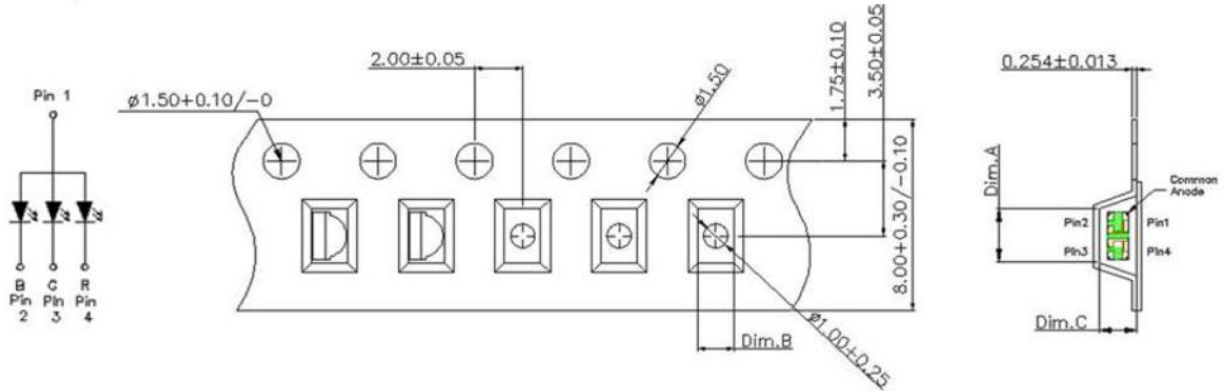
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### Precaution for Use

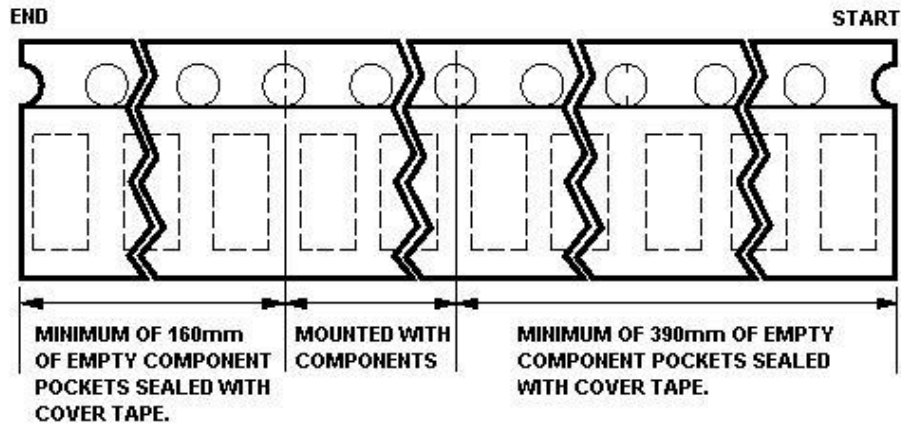
1. The chips should not be used directly in any type of fluid such as water, oil, organic solvent, etc.
2. When the LEDs are illuminating, the maximum ambient temperature should be first considered before operation.
3. LEDs must be stored in a clean environment. A sealed container with a nitrogen atmosphere is necessary if the storage period is over 3 months after shipping.
4. The LEDs must be used within 4 weeks after unpacked. Unused products must be repacked in an anti-electrostatic package, folded to close any opening and then stored in a dry and cool space.
5. The appearance and specifications of the products may be modified for improvement without further notice.
6. The LEDs are sensitive to the static electricity and surge. It is strongly recommended to use a grounded wrist band and anti-electrostatic glove when handling the LEDs. If a voltage over the absolute maximum rating is applied to LEDs, it will damage LEDs. Damaged LEDs will show some abnormal characteristics such as remarkable increase of leak current, lower turn-on voltage and getting unlit at low current.

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## Packaging Tape Dimension

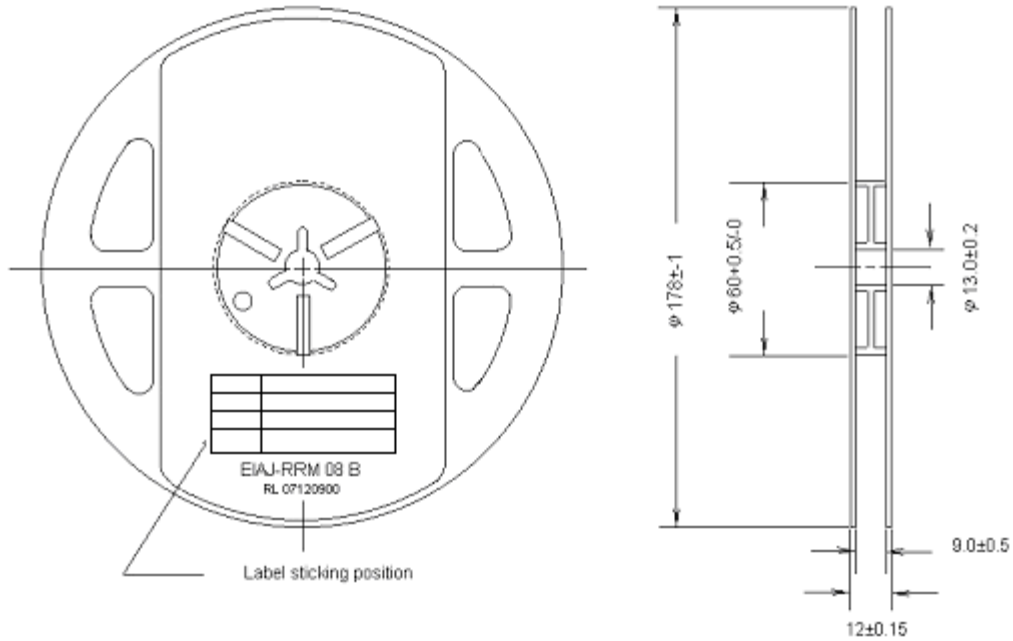


Dim. A	Dim. B	Dim. C	Q'ty/Reel
2.25±0.1	1.5±0.1	1.15±0.1	4K

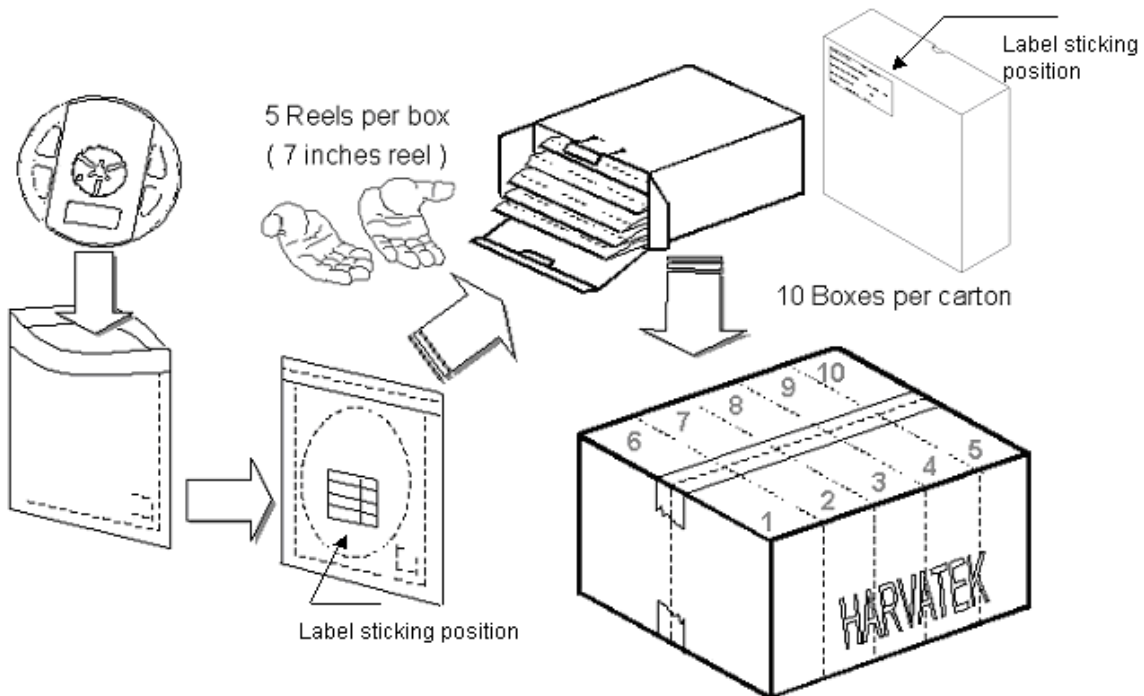


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## Reel Dimension



## Packing



5 boxes per carton is available depending on shipment quantity.

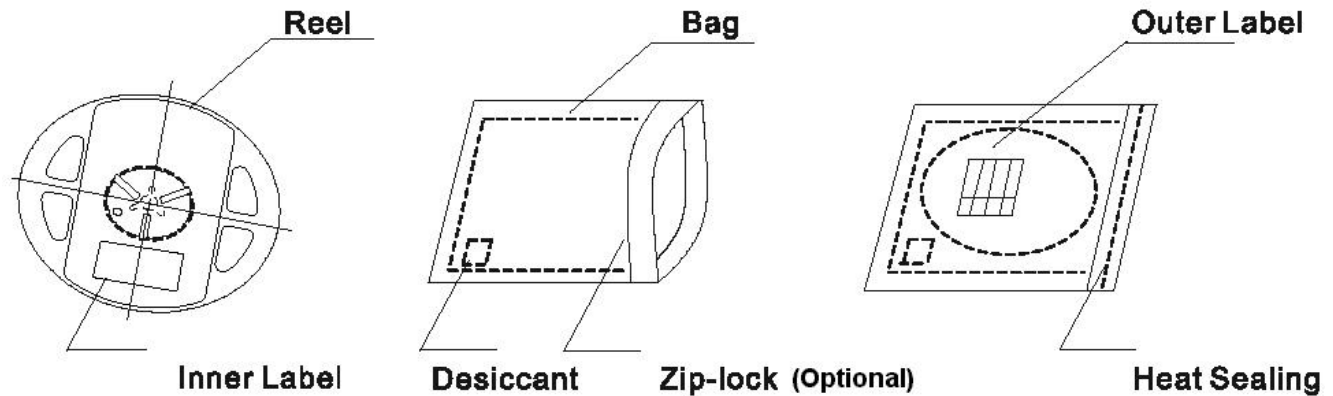
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## Dry Pack

All SMD optical devices are **MOISTURE SENSITIVE**. Avoid exposure to moisture at all times during transportation or storage. Every reel is packaged in a moisture protected anti-static bag. Each bag is properly sealed prior to shipment.

A humidity indicator will be included in the moisture protected anti-static bag prior to shipment.

The packaging sequence is as follows:



## Baking

Baking before soldering is recommended when the package has been unsealed for 4 weeks.

The conditions are as followings:

1.  $60\pm 3^{\circ}\text{C} \times (12\sim 24\text{hrs})$  and  $<5\%RH$ , taped reel type.
2.  $100\pm 3^{\circ}\text{C} \times (45\text{min}\sim 1\text{hr})$ , bulk type.
3.  $130\pm 3^{\circ}\text{C} \times (15\text{min}\sim 30\text{min})$ , bulk type.

## Precautions

1. Avoid exposure to moisture at all times during transportation or storage.
2. Anti-Static precaution must be taken when handling GaN, InGaN, and AlInGaP products.
3. It is suggested to connect the unit with a current limiting resistor of the proper size. Avoid applying a reverse voltage beyond the specified limit.
4. Avoid operation beyond the limits as specified by the absolute maximum ratings.
5. Avoid direct contact with the surface through which the LED emits light.
6. If possible, assemble the unit in a clean room or dust-free environment.

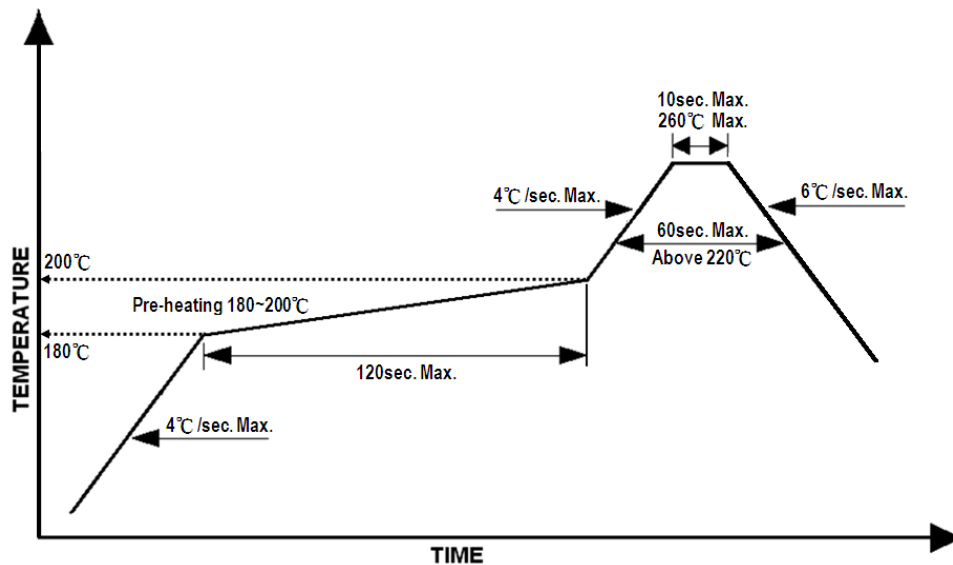
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## Reflow Soldering

Recommend soldering paste specifications:

1. Operating temp.: Above 220°C ,60 sec.
2. Peak temp.:260 °C Max.,10sec Max.
3. Reflow soldering should not be done more than two times.
4. Never attempt next process until the component is cooled down to room temperature after reflow.
5. The recommended reflow soldering profile (measured on the surface of the LED terminal) is as following:

### Lead-free Solder Profile



## Reworking

- Rework should be completed within 5 seconds under 260 °C .
- The iron tip must not come in contact with the copper foil.
- Twin-head type is preferred.

## Cleaning

Following are cleaning procedures after soldering:

- An alcohol-based solvent such as isopropyl alcohol (IPA) is recommended.
- Temperature x Time should be 50°C x 30sec. or <30°C x 3min
- Ultrasonic cleaning: < 15W/ bath; bath volume ≤ 1liter
- Curing: 100 °C max, <3min

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